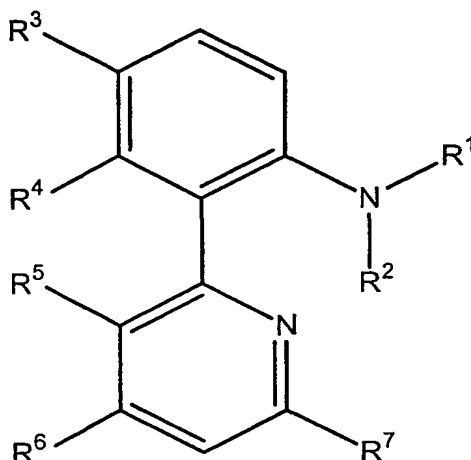


What is claimed is:

1. A compound of the formula



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wherein R¹, R², R³, R⁶ and R⁷ each represents hydrogen, halogen, or a substituted or unsubstituted radical independently selected from alkyl, aryl, acyl, aralkyl, heterocyclo, cycloalkyl, and SiR_aR_bR_c;

alternatively, R¹ and R², when taken together, form a =CR_aR_b group;

10

or, when taken together with the nitrogen atom to which they are attached, R¹ and R² form a heterocyclic ring structure, which may be unsubstituted or substituted;

R⁴ and R⁵ each represents halogen or a substituted or unsubstituted radical selected independently from alkyl, aryl, acyl, aralkyl, heterocyclo, cycloalkyl, and SiR_aR_bR_c;

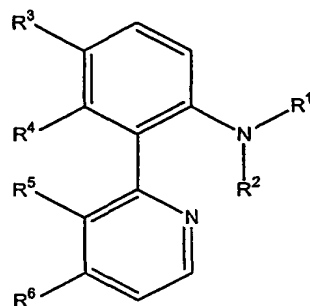
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alternatively, R³ and R⁴, when taken together with the carbon atoms to which they are attached, or R⁵ and R⁶, when taken together with the carbon atoms to which they are attached, form a ring structure;

R_a, R_b, and R_c each represents hydrogen or a substituted or unsubstituted radical independently selected from alkyl, aryl, acyl, aralkyl, heterocyclo, cycloalkyl; and said ring structure including R³ and R⁴ or R⁵ and R⁶ is selected from the group consisting of cycloalkyl, aryl, or heterocyclic, any of which may be substituted or unsubstituted.

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2. A process for the synthesis of a compound of formula



wherein R^1 , R^2 , R^3 , R^6 and R^7 each represents hydrogen, halogen, or a substituted or
 5 unsubstituted radical independently selected from alkyl, aryl, acyl, aralkyl, heterocyclo, cycloalkyl, and $\text{SiR}_a\text{R}_b\text{R}_c$;

alternatively, R^1 and R^2 , when taken together, form a $=\text{CR}_a\text{R}_b$ group;

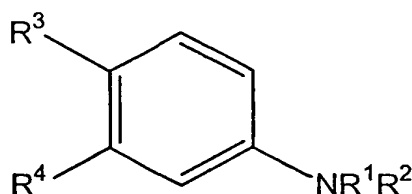
or, when taken together with the nitrogen atom to which they are attached, R^1
 and R^2 form a heterocyclic ring structure, which may be unsubstituted or
 10 substituted;

R^4 and R^5 each represents halogen or a substituted or unsubstituted radical selected
 independently from alkyl, aryl, acyl, aralkyl, heterocyclo, cycloalkyl, and $\text{SiR}_a\text{R}_b\text{R}_c$;

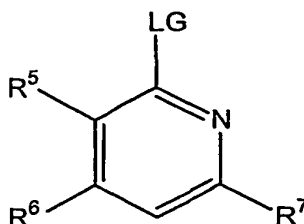
alternatively, R^3 and R^4 , when taken together with the carbon atoms to which
 they are attached, or R^5 and R^6 , when taken together with the carbon atoms to
 15 which they are attached, form a ring structure;

R_a , R_b , and R_c each represents hydrogen or a substituted or unsubstituted radical
 independently selected from alkyl, aryl, acyl, aralkyl, heterocyclo, cycloalkyl; and
 said ring structure including R^3 and R^4 or R^5 and R^6 is selected from the group
 consisting of cycloalkyl, aryl, or heterocyclic, any of which may be substituted or
 20 unsubstituted;

comprising reacting a compound of formula



with a compound of formula

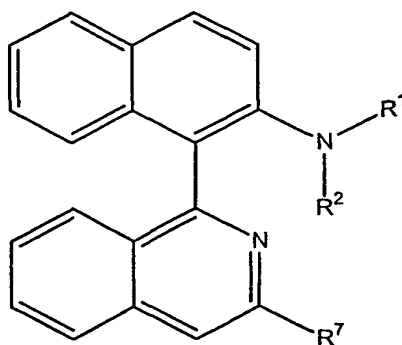


wherein LG represents a leaving group,
in the presence of an aluminum compound.

3. The process of claim 2 wherein one of R¹ and R² represents hydrogen.

4. The process of claim 2 wherein the aluminum compound is a dialkyl
aluminum chloride or trimethyl aluminum.

5. A compound of the formula



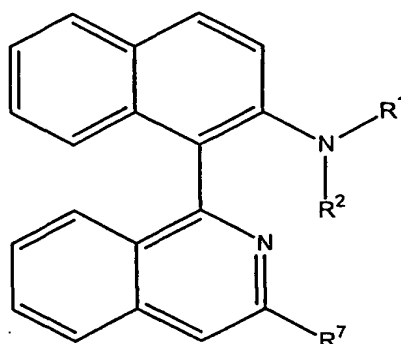
wherein R¹, R², and R⁷ each represents hydrogen, halogen, or a substituted or
unsubstituted radical independently selected from the group consisting of alkyl,
cycloalkyl, aryl, aralkyl, heterocyclo, acyl, and SiR_aR_bR_c;

alternatively, R¹ and R², when taken together, form a =CR_aR_b group;

or, when taken together with the nitrogen atom to which they are attached, R¹
and R² form a heterocyclic ring structure, which may be unsubstituted or
substituted ; and

R_a , R_b , and R_c each represents hydrogen, halogen, or a substituted or unsubstituted radical independently selected from the group consisting of alkyl, cycloalkyl, aryl, aralkyl, heterocyclo, and acyl.

- 5 6. A process for the synthesis of a compound of formula

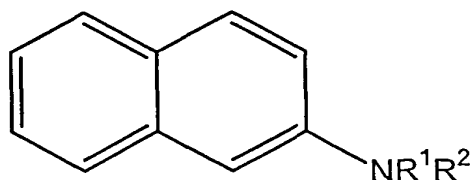


wherein R^1 , R^2 , and R^7 each represents hydrogen, halogen, or a substituted or unsubstituted radical independently selected from the group consisting of alkyl, cycloalkyl, aryl, aralkyl, heterocyclo, acyl, and $\text{SiR}_a\text{R}_b\text{R}_c$;

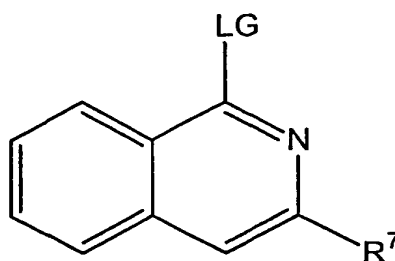
alternatively, R^1 and R^2 , when taken together, form a $=\text{CR}_a\text{R}_b$ group;

or, when taken together with the nitrogen atom to which they are attached, R^1 and R^2 form a heterocyclic ring structure, which may be unsubstituted or substituted ; and

R_a , R_b , and R_c each represents hydrogen, halogen, or a substituted or unsubstituted radical independently selected from the group consisting of alkyl, cycloalkyl, aryl, aralkyl, heterocyclo, and acyl;
comprising reacting a compound of formula



with a compound of formula



wherein LG is a leaving group,
in the presence of an aluminum compound.

5

7. The process of claim 6 wherein one of R¹ and R² represents hydrogen.

8. The process of claim 6 wherein the aluminum compound is a dialkyl aluminum chloride or trimethyl aluminum.

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9. A complex of a compound of claim 1 or claim 5 with a metal atom or with a proton.

10. The complex of claim 9, wherein the metal atom is a group IV metal.

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11. A process for olefin polymerization, wherein an olefin polymerization catalyst or mediator is derived from a pre-catalyst comprising a complex of claim 9.

12. A process for preparing a polyolefin by polymerizing an olefin in the presence of a polymerization catalyst, said catalyst comprising a complex of claim 9.

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13. The process of claim 11 or 12, wherein the complex is selected from the group consisting of (Me-IAN)₂ZrCl₂, (Me-IAN)₂ZrMe₂, (Ph-IAN)₂ZrMe₂, and (Bn-IAN)₂ZrMe₂.

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14. The complex of claim 9, wherein the metal is zirconium, zinc, or iron.

15. A process for olefin polymerization, wherein an olefin polymerization catalyst or mediator is derived from a pre-catalyst comprising a complex of claim 14.
16. A process for preparing a polyolefin by polymerizing an olefin in the presence
5 of a polymerization catalyst, said catalyst comprising a complex of claim 14.